DOCUMENT RESUME

ED 046 348 HE 001 937

AUTHOR	Fox, A. M.; Brookshire, William K.
TITLE	Defining Effective College Teaching Using the Delphi Technique and Multiple Linear Regression.
INSTITUTION	American Educational Research Association, Washington, D.C.
PUB DATE	Jan 71
NOTE	12p.; Paper presented at the 1971 Convention of the American Educational Research Association, New York City
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	*College Teachers, *Definitions, *Effective Teaching, *Evaluation, *Higher Education, Teacher Attitudes, Teacher Characteristics, Teaching Quality
IDENTIFIERS	*Delphi Technique, Northern Colorado University

ABSTRACT

A modified form of the Delphi technique was used within the School of Education at the University of Northern Colorado to formulate a definition of effective college teaching. The resulting definition contained 5 major categories: (1) personal characteristics: friendly, mature, enthusiastic; (2) professional qualities: attitudes, knowledge, preparation; (3) interpersonal relationships: approachable, fair, honest; (4) technical skills of teaching: methods, grading, organization; and (5) communication skills: rapport, relevancy, open. These results were used to develop 25 fictitious profiles of faculty members. Participants were asked to separate these 25 profiles into 5 sets according to those most deserving of promotion. Multiple linear regression was used to analyze these judgments to determine the priority placed on each of the major categories. (Author/AF)

ED046348

DEFINING EFFECTIVE COLLEGE TEACHING USING THE DELPHI TECHNIQUE AND MULTIPLE LINEAR REGRESSION

Fox, A.M.
Bureau of Research
University of Northern Colorado

Brookshire, William K.
North Texas State University

Presented to the

American Educational Research Association

1971 Convention

New York City

HE 001 937

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Defining Effective College Teaching Using The Delphi Technique And Multiple Linear Regression

Fox, A. M.
Brookshire, William K.

Short Abstract

A modified form of the Delphi Technique was used within the School of Education at the University of Northern Colorado to formulate a definition of effective college teaching. The resulting definition contained five major categories. These results were used to develop twenty-five fictitious profiles of faculty members. Participants were asked to separate these twenty-five profiles into five sets according to those most deserving of a promotion. Multiple linear regression was used to analyze these judgments to determine the priority placed on each of the major categories of the definition of effective teaching.

There has been recently an increased concern about the effectiveness of teaching at the higher levels. In particular there is deep concern about the quality of teaching currently in practice on college campuses. College students are asking for an opportunity to evaluate their professors. Many faculty members are becoming unhappy with a lock step salary scale, automatic promotions, and tenure. Instead, the faculty members desire a chance to prove themselves through some system of evaluation with the hope that an outstanding job on their part will be rewarded.

There is also some pressure from outside the academic community for evaluation of the effectiveness of college teaching. More and more the taxpayer is asking for evidence of value received for his tax dollar spent.

That there is a demand for the evaluation of the effectiveness of college teaching is no longer a question.

The question now before us is a professional question. One of how to accomplish this evaluation. If this professional question of the effectiveness of college teaching is to remain within the profession, we as educational researchers must work hard to find answers and outline strategems whereby the profession can set its own guidelines and standards for evaluation and in fact do the evaluation.

One of the first difficulties one encounters when attempting research in the area of effective teaching is that of locating a widely accepted definition of effective teaching.

As a part of the efforts being made at the University of Northern Colorado to develop useful evaluative techniques and instruments a study was undertaken to formulate a definition of effective teaching and further

to determine the relative importance of the various elements of such a definition.

Since the 1970 AERA convention brought out the fact that no one does a Delphi Study, we too used a modified version of a Delphi Study within the School of Education faculty at the University of Northern Colorado. Those interested in more information concerning the Delphi Technique are referred to the bibliography. There were 91 faculty members from the School of Education kind enough to participate in the study.

The first round of the modified Delphi Study asked each faculty member to list what he considered to be the ingredients of effective college teaching. They were encouraged to feel free in their response and to be as complete in their definition as they desired.

The returns from this first round were screened by the researchers in an effort to eliminate duplicate statements and to prepare a combined listing of all the statements in preparation for the second round.

There were 195 different statements, phrases, or key words, offered by the respondents in the first round. Examples of those statements are presented in Table I.

These statements, phrases, and key words were numbered and used as elements of a definition of effective college teaching in the second round of the study.

Each participant was asked in the second round to read through the 195 elements and check those which he felt should be retained as part of a definition of effective college teaching. It was anticipated that some elements would appear very similar in meaning. In such cases the

respondent was asked to check the element he felt best and leave the other similar elements unchecked. Space was provided for persons to add any elements they had thought of since the first round.

TABLE I

EXAMPLE OF FIRST ROUND RESPONSES

1. Ability to maintain discipline by being friendly and understanding yet demonstrates authority by being a genuine, sincere person.
2. Is warm, friendly and flexible.
3. Inspiring.
4. Enthusiasm.
5. Integration of concepts.
6. Think of students as individuals.
7. Empathize.
8. Respect for students' viewpoints.
9. Allows students to disagree.
10. Knowledge of the subject.
11. He starts where the students are.
12. Involve the students in creative learning.
13. An ability to communicate with the student.
14. Plans and prepares for each lesson.

The participants were also asked to group their checked items into areas of a similar nature or class and suggest a group title. This was accomplished by first stating a title and then listing the numbers of their checked elements which they felt belonged under this title.

The results of the second round were studied by the researchers.

First, the elements checked by the respondents as being necessary in a definition of effective college teaching were tabulated and a frequency count made. The frequency table for the 195 elements showed a decided break after the first 50 elements. These 50 elements became the material for round three.

Efforts to analyze the groupings proved too difficult. The analysis was especially difficult after having selected 50 elements and disregarding the remaining 145 elements. It was decided that further analysis was impossible and the study proceeded to the third round.

After duly thanking the participants for their previous efforts they were asked to examine the list of 50 most frequently checked elements and arrange them into natural groupings. In addition they were asked to provide a name representative of each group they selected.

The results of round three were studied in an effort to isolate major categories associated with effective college teaching.

The groupings were first analyzed as to content. The respondents were in unexpected agreement as to their organization of the elements. However, there were a wide variety of names assigned to the groupings. By comparing elements within a group it was possible to match up the various respondents groupings into a final listing of seven major categories.

Each category was given a multi-element heading or name made up of those suggested by the participants.

These tabulations were further analyzed and a final listing was prepared containing seven major categories. Each category was given the two most frequent names and contained the five most frequent elements.

In round four the participants were asked to select the name they favored for each category and also select the three elements within the category which they felt best described the category. They were further instructed to combine any of the major categories which they felt should be so combined and briefly explain their rational.

The results of round four indicated that there should be five major categories. The major categories were identified by using the most frequently checked name plus the three most frequently checked elements. The results of this fourth round are presented as the final results of this part of the study and are found in Table II.

TABLE II

Major Categories of Effective Teaching

1. Personal Characteristics:
   Friendly, Mature, Enthusiastic

2. Professional Qualities:
   Attitudes, Knowledge, Preparation

3. Interpersonal Relationships:
   Approachable, Fair, Honest

4. Technical Skills of Teaching:
   Methods, Grading, Organization

5. Communication Skills:
   Rapport, Relevancy, Open

The second major portion of this research effort was to determine the relative importance of the five elements of the definition.

The results of the Delphi Study were used to develop twenty-five fictitious profiles of faculty members. Each profile was a rating scale

consisting of five nine-point Likert type items. The profiles had the following form:

1.	Personal Characteristics: Friendly, Mature, Enthusiastic	1	2	3	4	5	6	7	8	9
2.	Professional Qualities: Attitudes, Knowledge, Preparation	1	2	3	4	5	6	7	8	9
3.	Interpersonal Relationships: Approachable, Fair, Honest	1	2	3	4	5	6	7	8	9
4.	Technical Skills of Teaching: Methods, Grading, Organization	1	2	3	4	5	6	7	8	9
5.	Communication Skills: Rapport, Relevancy, Open	1	2	3	4	5	6	7	8	9

The profiles used are presented in columns 1-5 of Table III.

Therefore, each faculty member (judge) made a judgment of the importance of the various items on the profiles. For example, if a particular judge felt that item number five, Communication Skills, was most important in determining promotions, he would tend to place profiles in Set Number 1 which had ahigh rating on item five. When the separation of the profiles was complete, each judge had associated a rank from 1-5 with each profile.

In order to have high ratings on the profile associated with high judgments, the weight of the judgments were reversed before the data was tabulated. That is, profiles placed in Set Number 1 were given a value of 5, Set Number 2 a value of 4, etc.

TABLE III

	PROFILE					JUDGES		
	Personal Characteristics	Professional Qualities and Attitudes	Interpersonal Relationships	Technical Skills of Teaching	Communication Skills	Judge 1	Judge 2	Judge 3
ID	1	2	3	4	5	6	7	8
1	5.	7.	6.	5.	3.	2.	3.	3.
2	5.	7.	5.	4.	6.	5.	1.	3
3	5.	6.	7.	5.	4.	5.	1.	3.
4	5.	6.	5.	4.	7.	4.	2.	5.
5	5.	6.	4.	5.	8.	3.	1.	4.
6	5.	4.	7.	6.	5.	2.	4.	1.
7	5.	4.	5.	6.	7.	3.	5.	2.
8	8.	6.	5.	5.	4.	5.	2.	5.
9	7.	5.	6.	4.	5.	4.	2.	5.
10	7.	5.	5.	3.	6.	1.	5.	5.
11	7.	4.	5.	6.	5.	2.	5.	5.
12	7.	5.	4.	5.	6.	2.	2.	4.
13	6.	8.	5.	5.	4.	5.	1.	4.
14	6.	5.	5.	7.	4.	4.	4.	2.
15	6.	5.	4.	7.	5.	3.	4.	2.
16	6.	3.	5.	5.	7.	1.	5.	5.
17	6.	4.	8.	5.	5.	3.	3.	5.
18	3.	7.	6.	5.	5.	2.	3.	4.
19	4.	6.	5.	7.	5.	5.	1.	1.
20	4.	5.	6.	7.	5.	4.	3.	2.
21	4.	5.	7.	6.	5.	4.	3.	2.
22	4.	5.	5.	8.	6.	5.	4.	1.
23	5.	5.	6.	7.	4.	4.	2.	1.
24	5.	5.	7.	6.	4.	4.	2.	2.
25	5.	5.	3.	7.	6.	1.	5.	1.

Faculty members were sent a set of the twenty-five profiles with the following instructions:

> You are asked to separate the enclosed 25 fictitious profiles into five sets. Those individuals you feel most deserving of promotion are to be placed in set Number 1, the next most deserving are to be placed in set Number 2, and so on, until the last are placed in set Number 5. Please place at least one profile in each of the five sets.
> It is not necessary to rank them within each set; merely list the profile member(s) in each set.

Multiple Linear Regression, see bibliography, was used to find which of the items on the profileswere being used to make the judgment and the order of priority placed on the items by a particular judge. In the regression model the judgments of a judge were used as the criterion and the five vectors of profile scores were used as predictors. Columns 6, 7, and 8 in Table III are three samples of judgments received. The predictors were dropped from the model one at a time and the contribution of each was tested with the F statistic. The contribution of a predictor was considered important if the Fratio was significant at the .05 level. The items that contributed significantly for a particular judge were ranked in the order of the associated F ratio, highest value being assigned a 1. Non-significant items were not ranked. These rankings are summarized in Table IV.

Sixty-one judges particupated in the study. In most cases only one or two of the items on the profile made a significant contribution to the prediction of a particular set of judgments. This is apparent from the relative lack of 3's, 4's and 5's in Table IV. The average number of significant items per judge was 2.38.

Inspection of Table IV shows that about 38% of the judges considered item 2, Professional Qualities, to be the most important in deciding on faculty promotion. By combining rankings of 1 and 2 it can be seen that items 1, 3, and 5 were about equally applied by the judges.

These items are Personal Characteristics, Interpersonal Relationships, and Communication Skills. Item 4, Technical Skills, was considered to be of least importance to this group of faculty members in deciding promotions.

TABLE IV

Rankings of Predictor Variables

Item	Rank					ms	Total
	1	2	3	4	5		
Personal Characteristics	13	7	2	5	1	33	110
Professional Qualities	23	4	7	2	0	25	156
Interpersonal Relationships	5	12	4	3	4	33	95
Technical Skills	7	4	5	5	2	38	78
Communication Skills	9	11	6	1	3	31	112

In brief summary, the modified Delphi portion of the study selected five major characteristics of effective teaching. These five major characteristics are:

Personal Characteristics

Professional Qualities

Interprersonal Relationships

Technical Skills of Teaching

Communication Skills

These characteristics were used to develop artificial profiles for use in the last part of the study.

The profiles were sorted by 61 judges as tp preference for promotion.

These sorts were analyzed by multiple linear regression and it was found that category 2, Professional Qualities, was deemed most important. Categories 1, Personal Characteristics; 3, Interpersonal Relationships; and 5, Communication Skills were approximately euqlly valued as second in importance. Characteristic 4, Technical Skills was least important.

The researchers feel that this study has demonstrated the usability of the Delphi technique in areas that heretofore have been difficult to study due to problems of definition. The study also points up that the evaluation of the effectiveness of teaching must take into consideration variable weighting of the predictor variables.

References:

Christal, R.E. "Selecting a Harem--and Other Applications of the Policy--Capturing Model." The Journal of Experimental Education, 1968, 36 (4), 35-41.

Kelly, F.J., et al Research Design in the Behavioral Sciences--Multiple Regression Approach, Southern Illinois University Press, Carbondale, 1969.

Ward, J.H., Jr. "Multiple Linear Regression Models." In Harodl Borko (Ed.) Computer Applications In The Behavioral Sciences. Englewood Cliffs, N.J. Prentice-Hall, Inc., 1962, 204-237.